UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

TK HOLDINGS, INC.,

Plaintiff/Counter-Defendant,

-vs-

CTS CORP., et al.,

Defendants/Counter-Plaintiff.
_____/

Case No. 08-14266

Hon: AVERN COHN

CTS CASE

MEMORANDUM AND ORDER ON CLAIM CONSTRUCTION[1]

[1] Ordinarily, the Court would hold a hearing on this matter. However, upon review of the parties' papers, the Court finds that oral argument is not necessary. See E.D. Mich. LR 7.1(f)(2).

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I. Introduction

This is a patent case. Before the Court are essentially parallel cases involving the parties. In the first case, TK Holdings, Inc. ("TK"), owner by assignment of U.S. Patent No. 7,100,944 B2, Method of Attaching a Seat Belt to a Seat Belt Tension Sensor, is suing CTS Corporation ("CTS") claiming infringement. This case is referred to as the TK case. The Court has already interpreted the disputed terms of the paradigm claim, Claim 19, of the '944 patent in the TK case. See Memorandum and Order on Claim Construction, filed May 26, 2010 (Doc. No. 69).

In the second case, CTS is suing TK claiming infringement of three of CTS's patents, also owned by assignment. This is referred to as the CTS case. The patents at issue in the second case are as follows:

> U.S. Patent No. 6,431,013, B2, Strain Gage Having An Attached Unstrained Area for the Mounting of Signal Conditioning Components ("the '031 patent")
>
> U.S. Patent No. 6,467,361 B2, Strain Gage Sensor Having an Unstrained Area ("the '361 patent")
>
> U.S. Patent No. 6,161,891, Vehicle Seat Weight Sensors ("the '891 patent)

The '031 and the '361 patents are the subject of the Markman[2] proceeding before the Court. As to the '013 patent, Claim 1 is the paradigm claim and the disputed terms are as follows:

> "center section"
>
> "step section"

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[2]See Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996). See also The Sedona Conference Report on the Markman Process, June 2006 Public Comment Version, available at www.thesedonaconference.org and Patent Case Management Judicial Guide (Federal Judicial Center 2009), Chapter 5

"the step section adapted to concentrate the weight applied thereon onto to[sic] the center section"

"wing section adapted to be out of the patent of the weight and not to flex"

The respective positions of the parties together with the Court's resolution are displayed in the claim chart attached as Exhibit A.

As to the the '361 patent, Claim 5 is the paradigm claim and the disputed terms[3] are as follows:

"wing section adapted to be out of a strain path"

"unstrained resistor"

The respective positions of the parties together with the Court's resolution are displayed in the claim chart attached as Exhibit B.

As the Court has repeatedly observed, claim construction in a Markman proceeding is always tentative and its conclusions are open to change as the case unfolds.

III. Legal Standard

Claim construction is a matter of law for the Court. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996). The focus is on "what one of ordinary skill in the art at the time of the invention would have understood the term to mean." Id. at 986.[4] The first step in construing a patent claim is to examine the intrinsic evidence:

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[3]Some of the disputed terms appear in both of CTS's paradigm claims.

[4]The parties in their papers did not clearly define who is one of ordinary skill in the art.

> First, we look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention. Although words in a claim are generally given their ordinary and customary meaning, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history.
>
> Thus, second, it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication. . . . The specification contains a written description of the invention which must be clear and complete enough to enable those of ordinary skill in the art to make and use it. Thus, the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.
>
> Third, the court may also consider the prosecution history of the patent, if in evidence. This history contains the complete record of all the proceedings before the Patent and Trademark Office, including any express representations made by the applicant regarding the scope of the claims. As such, the record before the Patent and Trademark Office is often of critical significance in determining the meaning of the claims. Included within an analysis of the file history may be an examination of the prior art cited therein.

Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996) (citations omitted).

These sources are analyzed in a hierarchical fashion, beginning with the " 'heavy presumption' " that claim terms mean what they say and carry their ordinary meaning as viewed by one of ordinary skill in the art. W.E. Hall Co. v. Atlanta Corrugating, LLC, 370 F.3d 1343, 1350 (Fed. Cir. 2004) (citing Johnson Worldwide Assocs., v. Zebco Corp., 175 F.3d 985, 989 (Fed. Cir. 1999)); Intellectual Property Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc., 336 F.3d 1308, 1315 (Fed. Cir. 2003). Dictionaries, encyclopedias, and treatises may be used to discover a term's ordinary

meaning. Altiris, Inc. v. Symantec Corp., 318 F.3d 1363, 1369 (Fed. Cir. 2003); Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202-03 (Fed. Cir. 2002).

As will be discussed, TK, like CTS did in the Markman proceeding involving the '944 patent, says that the specification plays a key, if not dispositive role, in interpreting the disputed terms in the paradigm claims. This Court has previously articulated the law on the role of the specification (and prosecution history) in determining a claim term's meaning, stating:

> Ordinary meaning, however, is not the end of the analysis; the specification and prosecution history must also be studied to determine if it is appropriate to afford a claim term its ordinary meaning. Kumar v. Ovonic Battery Co., 351 F.3d 1364, 1367-68 (Fed. Cir. 2003). The Federal Circuit recently explained the "twin axioms" regarding the role of the specification in claim construction:
>
> > On the one hand, claims must be read in view of the specification, of which they are a part. On the other hand, it is improper to read a limitation from the specification into the claims. Although parties frequently cite one or the other of these axioms to us as if the axiom were sufficient, standing alone, to resolve the claim construction issues we are called upon to decide, the axioms themselves seldom provide an answer, but instead merely frame the question to be resolved. We have recognized that there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification. As we have explained, an inherent tension exists as to whether a statement is a clear lexicographic definition or a description of a preferred embodiment. The problem is to interpret claims in view of the specification without unnecessarily importing limitations from the specification into the claims. That problem can present particular difficulties in a case such as this one, in which the written description of the invention is narrow, but the claim language is sufficiently broad that it can be read to encompass features not described in the written description, either by general characterization or by example in any of the illustrative embodiments.
>
> Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 904 (Fed. Cir. 2004) (citations and quotation marks omitted); see also Slimfold Mfg. Co. v.

Kinkead Indus., Inc., 810 F.2d 1113, 1116 (Fed. Cir. 1987) ("Claims are not interpreted in a vacuum, but are part of and are read in light of the specification.").

Thus, in certain situations, the specification or prosecution history may show an intent to depart from the ordinary meaning of a claim term. CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366-67 (Fed.Cir. 2002). For example, the patentee may act as his own lexicographer and explicitly define a term in the specification or prosecution history. Id. The patentee may also characterize "the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." Teleflex, Inc. v. Ficosa North America Corp., 299 F.3d 1313, 1327 (Fed. Cir. 2002); see Alloc, Inc. v. ITC, 342 F.3d 1361, 1377 (Fed. Cir. 2003) ("a claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee limited the scope of the claims"). If the "specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent" even if the language itself might be broad enough to cover the feature in question. SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1341 (Fed. Cir. 2001). Similarly, "when the preferred embodiment is described in the specification as the invention itself, the claims are not necessarily entitled to a scope broader than that embodiment." Modine Mfg. Co. v. ITC, 75 F.3d 1545, 1551 (Fed. Cir. 1996), abrogated on other grounds by Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558 (Fed. Cir. 2000), rev'd by 535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944 (2002). However, simply because the specification describes only one embodiment of the invention does not mean that the claims should automatically be limited to that embodiment. Liebel-Flarsheim, 358 F.3d at 906. Above all, the intrinsic evidence must show a clear and unmistakable intent to limit claim scope in order to overcome ordinary meaning and narrow a claim. Id.

Honeywell Intern., Inc. v. ITT Indus., Inc., 330 F. Supp. 2d 865, 867-77 (E.D. Mich. 2004).[5]

The Court went on to say:

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[5]The Court subsequently found the patent in Honeywell was not infringed, guided in large part by the Markman decision. See Honeywell Intern., Inc. v. ITT Indus., Inc., 2005 WL 5416765 (E.D. Mich. May 17, 2005) (NO. CIV.A. 02-73948) (unpublished). The Federal Circuit affirmed the Court's decision. See Honeywell Intern., Inc. v. ITT Indus., Inc., 452 F.3d 1312 (2006).

> It is a well established canon of claim construction that when a particular embodiment is described in the specification as the invention itself, and not just one way of utilizing it, the claims are not entitled to a scope broader than that embodiment. See Networld, LLC v. Centraal Corp., 242 F.3d 1347, 1352 (Fed. Cir. 2001); Wang Labs., Inc. v. America Online, Inc., 197 F.3d 1377, 1383 (Fed. Cir. 1999); Modine, 75 F.3d at 1551; Autogiro Co. of Am. v. United States, 181 Ct.Cl. 55, 384 F.2d 391, 398 (1967). For instance, if the specification calls an embodiment "the invention" or "the present invention," it is appropriate to limit the claims to that embodiment. See, e.g., Microsoft Corp. v. Multi-Tech. Sys. Inc., 357 F.3d 1340, 1348 (Fed. Cir. 2004) ("in light of those clear statements in the specification that the invention ('the present system') is directed to communications 'over a standard telephone line,' we cannot read the claims ... to encompass data transmission over a packet-switched network such as the internet."); SciMed, 242 F.3d at 1343-44 (holding that "the characterization of the coaxial configuration as part of the 'present invention' is strong evidence that the claims should not be read to encompass the opposite structure"); Watts v. XL Sys., Inc., 232 F.3d 877, 882-84 (Fed. Cir. 2000) (finding that "the specification actually limits the invention to structures that utilize misaligned taper angles, stating that 'the present invention utilizes [the varying taper angle] feature' "). The context in which the embodiment is described must always be considered to determine if the embodiment is the "invention" or just the "preferred embodiment." Wang Labs., 197 F.3d at 1383; Cultor Corp. v. A.E. Staley Mfg. Co., 224 F.3d 1328, 1331 (Fed. Cir. 2000) ("Whether a claim must, in any particular case, be limited to the specific embodiment presented in the specification, depends in each case on the specificity of the description of the invention and on the prosecution history. These sources are evaluated as they would be understood by persons in the field of the invention."). This is consistent with the axiom that statements in the specification must be clear in order to narrow the scope of a claim. See Teleflex, 299 F.3d at 1327.

Id. at 878-79.

Thus, a claim term must be given its ordinary meaning unless the patentee redefined the term in the specification or characterized "the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." Teleflex, Inc. v. Ficosa North America, 299 F.3d 1313, 1327 (Fed. Cir. 2002).

With these principles in mind, the Court considers the disputed terms.

III. The '013 Patent

A. Background

The '013 patent issued from an application filed as a continuation-in-part of the application for U.S. Patent No. 6,244,116 ("the '116 patent"). The '013 patent is directed to a weight sensor for detecting the presence of an occupant in an automobile seat and providing an electrical signal used to control activation of an airbag. '013 pat., col. 1, ll. 25-30.

As the specification explains, airbag deployment control systems seek to prevent injury to infants and small children resulting from deploying the air bag with excessive force. Id. at Col. 1, ll. 49-58. The weight sensor disclosed, known as a "resistive strain gauge sensor," measures force based on strain placed on electrical resistors. Id. at col. 1, ll. 34-36. Resistive strain gages utilize resistors whose resistance to the flow of electrical current changes based on the amount of mechanical strain applied on each resistor. An input voltage of known value is applied to the measurement circuit, resulting in the flow of electrical current through the resistors. An output voltage, measured at a point after the resistors, changes in proportion to the resistance values of the resistors. Because the resistance values change in proportion to the strain on the resistors from an applied force, the measured output voltage (and the voltage drop across the resistors) varies in proportion to the amount of force applied. Thus, the output voltage can be used to provide a weight reading. See id. at col. 1, ll. 34-40 and col. 3, ll. 26-37. The '013 patent explains that the output voltage signal in such sensors is typically quite small (i.e., in the millivolt range) such that even small interfering noise

signals from other electrical components can result in inaccurate weight readings. Id. at col. 1, ll. 58-64.

The '013 patent discloses two particular weight sensor designs that are purportedly less susceptible to interfering noise signals. Figure 1, which illustrates the first disclosed embodiment, is reproduced below with the reference numbers identified in accordance with the terminology used in the written description of the specification.

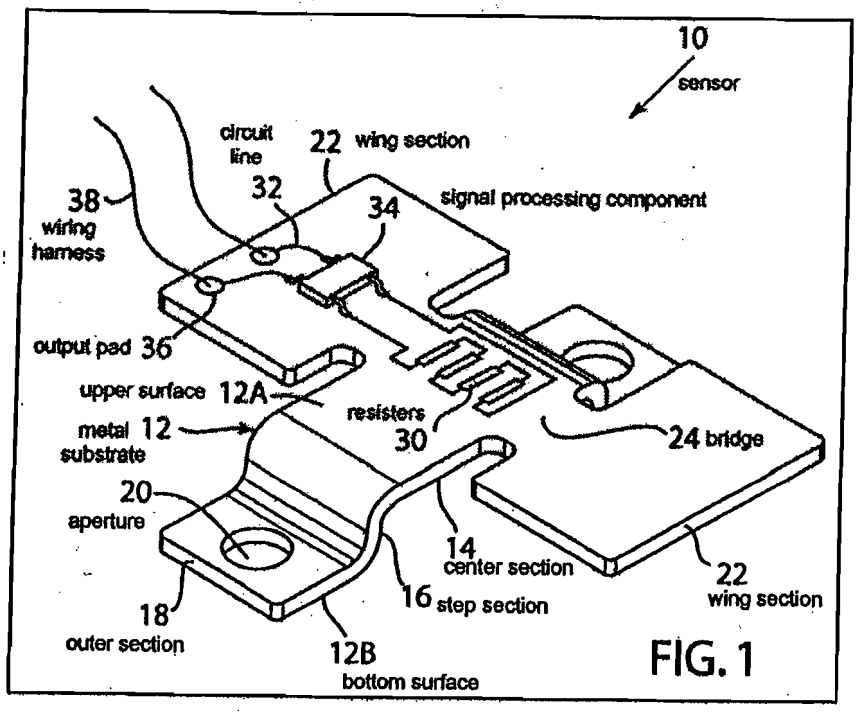

FIG. 1

The sensor 10 includes metal substrate 12, which has "step sections 16 that extends [sic] downwardly generally perpendicularly on both sides of a center section 14." Id. at col. 3, ll. 8-12. Strain gage resistors 30 are located on the center section of the substrate, and a voltage source (not shown) is applied to the measuring circuit in accordance with the general principles of strain gage sensors described above. Id. at Col. 3, ll. 26-38. Outer flat sections 18 connect with, and extend away from, the step sections. The outer sections include apertures for receiving fasteners to attach the strain gage to a structure that supports the seat. Id. at col. 3, ll. 12-17.

The the two step sections 16 extend downwardly from the raised center section to the lower outer sections creating a vertical step between those regions of the metal substrate 12. According to the specification, the step sections function to "concentrate the force of the weight to be measured onto the center section causing the center section to slightly flex." Id. at col. 3, ll. 18-20. The disclosed sensor of the '013 patent also has wing sections 22 attached by bridges 24 to the center section 14. The bridges are regions where the substrate has a narrowed width. The wing sections are located such that the weight applied to the strain gage does not cause the wing sections to flex or have strain therein. Id. at col. 3, ll. 20-26.

In accordance with the invention of the '013 patent, signal processing component 34, which may include amplifiers, filters and signal converters, is mounted on a wing section. Id. at col. 3, ll. 37-41. The patent specification touts that the low or reduced strain at the wing section protects the solder joints of the signal processing component. It also states that this location allows for a short connection between the signal

processing component and the strain resistors, thus reducing the size of the sensor and making it less susceptible to interference from noise signals. Id. at col. 4, ll. 2-11.

The other disclosed embodiment of the invention is illustrated in Figure 2 which is also reproduced below. The sensor of Figure 2 differs from that of Figure 1 in that it does not have downwardly extending regions between center section 14 and outer sections 18. In this embodiment, the outer sections 18 are separated from the center section 14 by flat or planar regions and not by "step sections."

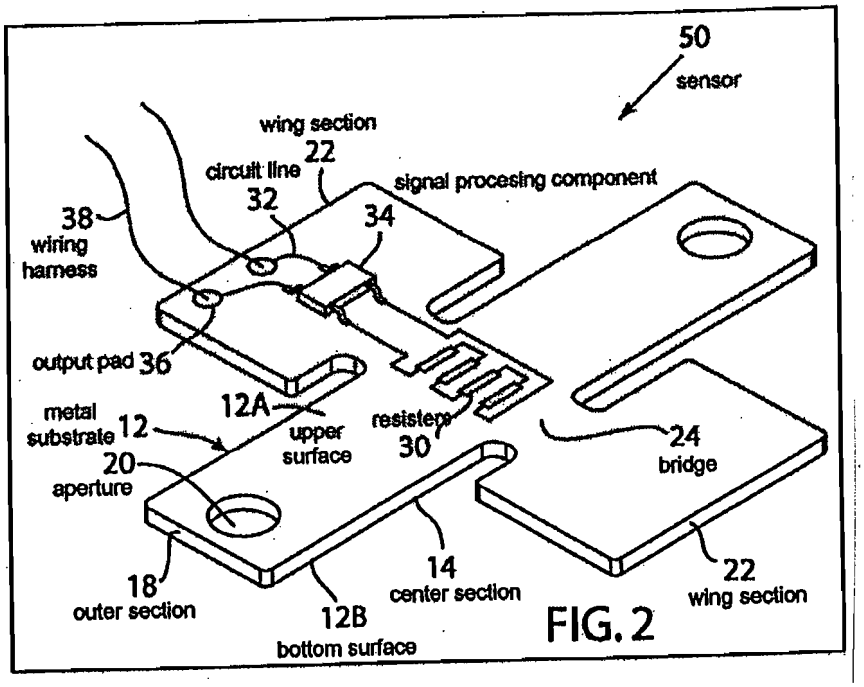

FIG. 2

B. Claim 1

As noted above, CTS designated claim 1 as the paradigm claim. See Doc. No. 27.[6] TK then identified ambiguous words/phrases in claim 1. See Doc. No. 29. CTS then responded with its proposed constructions of the words/phrases identified by defendant. See Doc. No. 35. The parties then filed Markman briefs. See Doc. Nos. 57, 64, 65.

Claim 1, in alphanumeric format, reads:

1. A weight sensor for measuring a weight applied to the sensor, comprising:

    a) a substrate including:

        1) a center section that is adapted to flex in response to the applied weight;

        2) at least one step section attached to the center section, the center section located adjacent the step section, the step section adapted to concentrate the weight applied thereon onto the center section; and

        3) at least one outer section attached to the step section;

    b) at least one strain gage resistor, mounted on the center section of the substrate, for generating an electrical signal in response to the substrate being stressed; and

    c) at least one wing section attached to the center section, the wing section adapted to be out of the path of the weight and not to flex, the wing

[6]CTS also asserts claims 2, 4, 5, 6 and 7.

section containing signal conditioning electronic operative to condition the electrical signal.

The interpretation of the underlined words/phrases is disputed.[7] These words/phrases read:

(1) center section

(2) step section

(3) step section adapted to concentrate the weight applied thereon onto the center section

(4) wing section adapted to be out of the path of the weight and not to flex

C. Claim Terms

1. "center section"

The parties' proposed constructions are as follows:

CTS	TK
mid-portion of the substrate contiguous with the step section and capable of flexing in response to force transmitted by the step section whin the substrate experiences stress	a flexible central portion of the substrate onto which the force of weight is directed by the step section

CTS has the better view. Figure 1 of the '013 patent, above, shows that center section (14) is the mid-portion of the substrate, which is connected with the step section (16). The specification further explains that the center section may flex in response to

[7]The parties agreed that the term "weight" means a "force by which a body or object is attracted to earth by gravity."

force received from the step section by an applied weight. See '013 pat., col. 2, ll. 19-20; and col. 3, ll. 18-22.

TK's proposed interpretation is problematic. First, it introduces the language "force of weight" which departs from the agreed upon meaning for the term "weight." Adopting TK's construction would result in an interpretation of the claim where the step section causes a "force of a force by which a body or object is attracted to earth by gravity" to be applied. Moreover, the word "directed" is not found in the specification. TK's proposed interpretation also appears to require that the weight being sensed must be applied directly to the substrate. While that may be found in the specification in discussing an embodiment, the claim language, however, does not require that the weight being sensed must be applied directly to the substrate. Instead, the claim language states that "the center section is adapted to flex "in response to the applied weight." In other words, the claim language states that the bending of the center section is in response to force applied, but does not require that the force is applied directly to the substrate itself.

Accordingly, the Court will adopt CTS' proposed interpretation, namely that the term "center section that is adapted to flex in response to the applied weight" means the "mid-portion of the substrate contiguous with the step section and capable of flexing in response to force transmitted by the step section when the substrate experiences stress."

2. "step section"

The parties' proposed constructions are as follows:

CTS	TK
the offset portion of the substrate between the center section and the outer section and the outer section of the substrate	a portion of the substrate that extends downwardly from the center section to an outer section of the substrate

Claim 1 of the '013 patent recites "at least one step section attached to the center section." This term is not expressly defined in the specification, thus the ordinary meaning controls. See Johnson Worldwide Assoc., Inc. v. Zebco Corp., 175 F.3d 985 (Fed. Cir. 1999). Essentially the dispute revolves around whether the claimed "step section" can be limited to the particular three-dimensional depiction shown as a preferred embodiment. CTS, of course, says it is not and that the common and ordinary meaning of step includes a planar, i.e., two-dimensional configuration, as well as three-dimensional configuration, because the stated purpose of the step section, namely force concentration, can be achieved by either configuration. Indeed, evidence that a "step section" can be a planar or a three-dimensional offset according to the ordinary meaning of the word "step" as used by those skilled in the mechanical arts is amply demonstrated in dictionaries. A "step" is merely an offset portion. See e.g., Knight's American Mechanical Dictionary (1876), page 2375. See also Oxford English Dictionary, 3d ed., (2004).

TK's proposed interpretation, "a portion of the substrate that extends downwardly from the center section to an outer section of the substrate" is too narrow. The "extends downwardly" language is imported from the preferred embodiment of the specification. See '013 pat., col. 3, ll. 11-12. As noted above, it is improper to read a limitation from the specification into the claims. Even when the specification describes a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction. TK has not identified any such words or expressions of manifest exclusion or restriction. There is none.

In the section "Detailed Description of the Preferred Embodiments" the step sections are described as "extend[ing] downwardly generally perpendicularly on both sides of center section. Id. at col. 3, ll. 11-12. However, this restriction does not appear in the Summary of the Invention, nor does it appear in the paradigm claim. Rather, it only appears in the preferred embodiment. Both the Summary of the Invention and the claims more broadly characterize the "step section" as the portion of the substrate that concentrates the weight (force) onto the center section. Id. at col. 2, ll. 22-24 and col. 3, ll. 17-18. There is no indication, clear or otherwise, that the patentee intended to exclude a two-dimensional step section or limit the invention to a three-dimensional step. Absent a clear disavowal or contrary definition in the specification or the prosecution history, the patentee is entitled to the full scope of the claim language. Home Diagnostics, Inc. v. LifeScan, Inc., 381 F.3d 1352, 1358 (Fed. Cir. 2004).

CTS' interpretation is also supported by the intrinsic evidence. Figure 1 shows that the step section (16) is located between the center section (14) and the outer

section (18). The specification further teaches that the purpose of the "step section" is to concentrate a force onto the center section. Id. at col. 2, ll. 22-24. Claim 1 states as such. This force concentration can occur if the "step section" is either a planar or three-dimensional offset. Thus, contrary to TK's position, the specification does not require that the "step section" extends downwardly from the center section. Id. at col. 2, ll. 17-32; and col. 3, ll. 10-19. Instead, such a configuration is merely a preferred embodiment.

Finally, CTS' interpretation of the term "step section" is further supported by the doctrine of claim differentiation. Claim differentiation stands for the "presumption that each claim in a patent has a different scope." See Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374, 1380 (Fed. Cir. 2006). Independent claim 8 of the '013 patent characterizes the weight sensor substrate as being "gull wing shaped." Id. at col. 5, ll. 5-9. This gull wing shape is found as a preferred embodiment, and is directed to a three-dimensional type of step section. As such, claim 1 of the '013 Patent (as well as claim 5 of the '361 Patent) is presumed to be of different scope from claim 8 of the '013 Patent (and Claim 11 in the '361 Patent), and cannot be limited to the three-dimensional step embodiment. The term "step section" means what it says. TK has not overcome this heavy presumption.

Accordingly, the Court adopts CTS' interpretation of "step section" to mean "the offset portion of the substrate between the center section and the outer section and the outer section of the substrate."

3. "step section adapted to concentrate the weight applied thereon onto to [sic][8] the center section"

The parties' proposed constructions are as follows:

CTS	TK
the step section causes a stress concentration in the mid-portion of the substrate contiguous with the step section and capable of flexing in response to a force transmitted by the step section when the substrate experiences stress	the step section causes a force of weight applied on the step section to be directed onto the center section of the substrate

CTS again has the better view. First, the intrinsic evidence supports CTS' interpretation. The claim language and the specification of the '013 patent describe the functionality of the step section. The claim states that the step section is adapted to concentrate the weight, i.e., force, onto the center section. As explained in the specification, "the step sections concentrate the force of the weight to be measured onto the center section causing the center section to slightly flex." '013 pat., col. 3, ll. 17-19. Moreover, Figure 1 teaches that the mid-portion (14) is contiguous with the step section (16). The specification further teaches that when a force is applied to the substrate, such force is concentrated by the step section. Id. at col. 2, ll. 22-24. After this occurs, the step section transfers the concentrated force to the mid-portion, thereby causing the mid-portion to flex.

[8]The parties agree that the additional word "to" should be disregarded as a clear typographical error.

TK's interpretation–that a weight force be directed onto the center section–is misleading. The specification makes clear that a passenger's weight, i.e., the gravitational force on his or her body, is transmitted to the sensor and concentrated by the step section to the center section. TK's proposed interpretation results in a claim that would not describe the preferred embodiment, because the preferred embodiment expressly states that the passenger's weight is not applied directly to the sensor; rather, it is directed to "a structure that supports a weight or force to be measured" and "the step sections concentrate the force of the weight to be measured onto the center section causing the center section to slightly flex." However, the specification does not require the step section to "direct" a weight onto the center. Id. at col. 2, ll. 17-32; and col. 3, ll. 10-20. Contrary to TK's proposed language, there is no suggestion in the patent specification of weight transfer from the step section to the center section. Common sense tells us that is not what is happening during the operation of the seat weight sensors. Instead, the sensor, such as strain gage 10, is attached to a "structure that supports a weight or force to be measured." Id. col. 3, ll. 15-17.

Accordingly, the Court adopts CTS' interpretation. The phrase "step section adapted to concentrate the weight applied thereon onto to [sic] the center section" means "the step section causes a stress concentration in the mid-portion of the substrate contiguous with the step section and capable of flexing in response to a force transmitted by the step section when the substrate experiences stress."

4. "wing section adapted to be out of the path of the weight and not to flex"

The parties' proposed constructions are as follows:

CTS	TK
a portion of the substrate contiguous with the center section, but does not flex in response to stress transmitted to the center section by the step section	the wing section is configured so that the force of weight applied on the substrate does not impact the wing section of cause it to flex

The Court agrees with CTS. In Figure 1, the wing sections (22) are contiguous with the center section (14). The specification only states that the wing sections are configured so they do not flex when force is transmitted to the center section via the step section. '013 Pat., col. 2, ll. 28-32; col. 3, ll. 21-27; and col. 4, ll. 2-16.

TK's proposed interpretation is improper because of the use of the redundant term "force of weight." It is also inconsistent with the context and ordinary claim meaning as a whole, because (a) the specification teaches that the wing section is not affected by the weight the presence of which is to be detected; and (b) the specification does not teach or suggest that a "weight force" pushes down on the sensor substrate. Instead, the specification teaches that the force to which the weight sensor is subjected when the vehicle seat is occupied is first received at the outer flat sections 18 and transmitted to the center section 14 along the path defined by the step sections but without involvement of the wing sections. '013 pat., col. 3, ll. 12-19.

The claim language is clear. The wing section is simply a portion of the substrate that is connected to the center section, yet is positioned such that force experienced by the center portion does not cause the wing section to flex.

TK's proposed interpretation attempts to add limitations that are not in the claim or specification, particularly as to where the weight to be measured is applied. The specification states that in the preferred embodiment the outer sections of the sensor are fastened to a support structure for supporting the weight to be measured, and that the weight applied to the outer sections is transferred through the step sections to the center. However, in the context of the claim and the specification, the weight acting upon the step section does not directly act on the step section. Rather, the wing section is adapted such that it will not flex in normal operation when the force is transmitted by the step section to the center section and causes the center section to flex:

> The wing sections 22 are located out of the strain or flexing path that affects center section 14. The weight applied to strain gage 10 does not cause the wing sections to flex or have strain therein.

Id. at col. 3, ll. 22-25.

Accordingly, the Court adopts CTS' construction. The phrase "wing section adapted to be out of the path of the weight and not to flex" means "a portion of the substrate contiguous with the center section, but does not flex in response to stress transmitted to the center section by the step section."

IV. The '361 Patent

A. Background

The '361 patent is entitled "Strain Gage Having An Unstrained Area." It issued as a continuation-in-part of the application for the '031 patent which is a continuation-in-part of the application for the '116 patent. Like the related patents, the '361 patent is directed to a weight sensor for detecting the presence of an occupant in an automobile seat and providing an electrical signal used to control activation of an airbag. '361 pat., col. 1, ll. 25-30. As the patent explains, airbag deployment control systems seek to prevent injury to infants and small children resulting from deploying the air bag with excessive force. Id. at col. 1, ll. 51-59.

The type of weight sensor disclosed in the '361 patent, known as a "resistive strain gauge sensor," measures force based on strain placed on electrical resistors. Id. at Col. 1, ll. 36-39. Resistive strain gages utilize resistors whose resistance to the flow of electrical current changes based on the amount of mechanical strain applied on each resistor. An input voltage of known value is applied to the measurement circuit, resulting in the flow of electrical current through the resistors. An output voltage, measured at a point after the resistors, changes in proportion to the resistance values of the resistors. Because the resistance values change in proportion to the strain on the resistors from an applied force, the measured output voltage (and the voltage drop across the resistors) varies in proportion to the amount of force applied. Thus, the output voltage can be used to provide a weight reading. Id. at col. 1, ll. 36-42 and col. 3, ll. 40-45.

The '361 patent refers to a known (prior art) sensor design in which four strain gage resistors are connected in a "wheatstone bridge" circuit configuration, with two resistors placed on top and two resistors placed on the bottom surface of the substrate. In this arrangement, two of the resistors will be placed in tension and two in compression when force is applied. In a wheatstone bridge circuit, the resistors are electrically connected such that with the resistance of two resistors increasing, and two decreasing, a greater change in the voltage measured across the circuit is detected. Id. at col. 1, l. 61 to col. 2, l. 5.

The specification mentions several purported drawbacks of the prior art design, including high manufacturing expense and difficulty controlling the characteristics of the resistors when fabricated on opposite surfaces of the substrate. '361 pat., col. 2, ll. 6-17. Like its parent '013 patent, the '361 patent discloses strain gage weight sensors having a substrate that includes a center section designed to flex and wing sections designed not to flex.

Two embodiments are disclosed. The embodiment of Figure 2, which utilizes a similar substrate as the embodiment of Figure 1 of the '013 patent, is reproduced below with reference numerals identified.

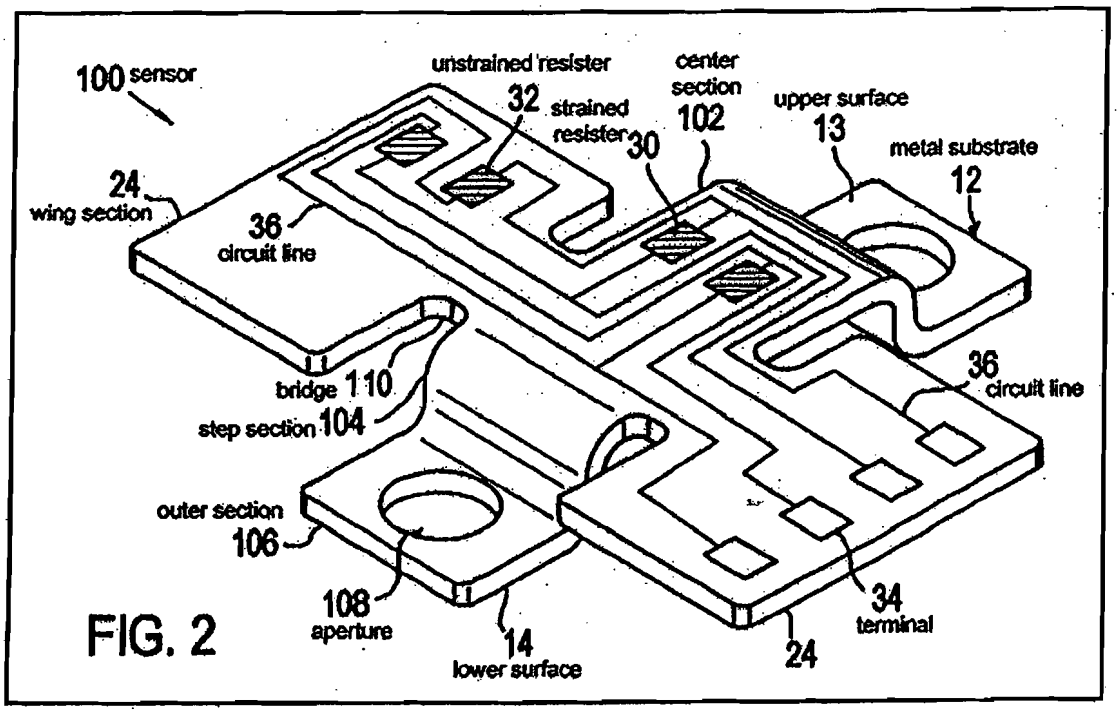

FIG. 2

As is shown, step sections 104 "extend downwardly generally perpendicularly on both sides of a center section 102" to outer flat sections 106 of metal substrate 12. Id. '361 pat., col. 4, ll. 10-15.) As in the '013 patent, the step sections function to concentrate the force of the weight onto the center section. Id. at col. 4, ll. 16-18. Wing sections 24 are attached to the center section by bridges 110. These are located out of the strain path that affects center section 102 such that the weight applied to the strain gage does not cause the wing sections to flex. Id. at col. 4, ll. 19-25. In this embodiment, two "strained resistors 30" are mounted on the top surface of the substrate center section and two "unstrained resistors 32" are mounted on the top surface of one wing section. The specification indicates that these strained and unstrained resistors can be connected in a wheatstone bridge configuration to provide the benefit of the prior art design of creating a greater change in the voltage measured across the circuit. The specification asserts that mounting all of the resistors on the

same surface of the substrate -- but with two resistors on the unstrained wing section -- provides for faster and less expensive fabrication and allows the resistors to be fabricated in a more uniform manner. Id. at col. 4, ll. 52-65.

The alternative embodiment of Figure 1 of the '361 patent also utilizes two strained and two unstrained strain gage resistors connected in a wheatstone configuration, but on different type of substrate.

B. Claim 5

As noted above, CTS designated claim 5 as the paradigm claim. See Doc. No. 27.[9] TK then identified ambiguous words/phrases in claim 5. See Doc. No. 29. CTS then responded with its proposed constructions of the words/phrases identified by defendant. See Doc. No. 35. The parties then filed Markman briefs. See Doc. Nos. 58, 63, 66.

Claim 5, in alphanumeric format, reads:

1. A strain gage for measuring a force applied to the strain gage, comprising:

a) a substrate including:

1) a center section that is adapted to flex in response to the applied weight;

2) at least one step section attached to the center section, the center section located adjacent the step section, the step section adapted to concentrate the weight applied thereon onto to the center section; and

3) at least one outer section attached to the step section;

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[9]CTS also asserts claims 1, 6, 10 and 15.

b) at least one strained resistor, mounted on the center section of the substrate, for generating an electrical signal in response to the substrate being stressed;

c) at least one wing section attached to the center section, the wing section adapted to be out of a strain path; and

d) at least one unstrained resistor mounted on the wing section and wherein at least one terminal is mounted on the wing section.

The interpretation of the underlined words/phrases is disputed. The Court has already interpreted "center section," "step section," and "step section adapted to concentrate the weight applied thereon onto the center section" in discussing the '013 patent. The '361 patent includes two additional disputed terms/phrases. They are:

(1) "wing section adapted to be out of a strain path"

(2) unstrained resistor

C. Claim Terms

1. "wing section adapted to be out of a strain path"

The parties' proposed constructions are as follows:

CTS	TK
wing section is a portion of the substrate contiguous with the center section but does not flex in response to a force transmitted to the center section by the step section	the wing section is configured so that the force of weight applied on the substrate does not cause strain in the wing section

Again, CTS's proposed interpretation carries the day. Figure 2 of the '361 Patent shows that the wing sections (24) are attached to the center section (102). The

specification also explains that the wing sections are "located out of the strain or flexing path that affects [the] center section." '361 Pat., Abstract; Col. 4, ll. 19-25. Thus, when a weight is applied to the strain gage, the wing sections do not flex. Id.

TK's proposed interpretation of a "wing section adapted to be out of a strain path" boil down to a second attempt to limit the claim such that the weight must be applied directly to the substrate. The claim language, however, does not require that weight must be applied directly to the substrate. Rather, the claim states that the wing section is configured such that as the center section is allowed to flex in response to an applied force, but the wing section is not caused "to flex or have strain therein." Id. Col. 4, ll. 23-25. There is no requirement that the weight is applied on the substrate. Rather, the claim clearly states that the center section is adapted to flex "in response" to weight applied.

Like the '013 patent, TK it attempting to read limitations from the specification into the claim and to limit the invention to a single preferred embodiment disclosed in the specification. In addition, in arguing that the disputed phrase should mean that: "the wing section is configured so that the force of weight applied on the substrate does not cause strain in the wing section," TK seeks to limit the location where the weight to be measured is applied. The claim, however, includes no language regarding where the supposed "force of weight" is applied. TK also confuses the issues by using the term "force of weight." Both parties have stipulated that "weight" is "a force by which a body or object is attracted to earth by gravity." "Force of weight" is redundant and meaningless. While the '361 patent uses the term "force of the weight," col. 4, ll.

17-19); "of the weight" clearly modifies the force that is applied. It is not that the weight itself is applied.

TK also reiterates its position on the force applied to the "step section" and transmitted to the "center section" which was addressed above in interpreting the '031 patent. In addition to the plain language of the claim requiring the force to act on the "step section" as discussed above, the context of the actual invention cannot require the weight to be applied directly to the substrate. In the context of the actual invention, the weight being measured is that of the passenger in the car seat. It does not follow that the passenger would sit directly on the substrate.

Rather, the '361 specification teaches otherwise:

> This invention relates to a force sensor or strain gage sensor for detecting the presence of a person having a weight in a car seat, and in particular to a strain gage that can detect the presence of an occupant using strain sensitive resistors and provide an electrical signal to control activation of an airbag.

'361 Pat., Col. 1, ll. 25-30.

> Referring to FIG. 2, another embodiment of a strain gage sensor 100 is shown. Sensor 100 has a metal substrate 12 with an upper surface 13 and a bottom surface 14. Metal substrate 12 is preferably formed from stainless steel. Substrate 12 has step sections 104 that extends downwardly generally perpendicularly on both sides of a center section 102. A pair of outer flat sections 106 connect with and extend away from step sections 104. Apertures 108 are located in outer sections 106. Fasteners (not shown) would be used to attach strain gage sensor 100 to a structure that supports a weight or force to be measured. The step sections concentrate the force of the weight to be measured onto the center section causing the center section to slightly flex.

Id., col. 4, ll. 8-20.

Accordingly, CTS' proposed interpretation is supported by the context of the claim language and the actual invention. As such, "wing section adapted to be out of a strain path" means "wing section is a portion of the substrate contiguous with the center

section but does not flex in response to a force transmitted to the center section by the step section."

2. "unstrained resistor"

The parties' proposed constructions are as follows:

CTS	TK
a resistor mounted to the wing section but not subject to a force derived from applied weight	a strain resistor whose resistance changes based on the strain from an applied force, but which is not strained by the force of weight applied on the substrate

CTS again has the better view. The abstract of the '361 patent states that the strain gage includes both a strained resistor and an unstrained resistor. This indicates that one resistor is to be subjected to strain, i.e., mechanical force, whereas the other is not. Importantly, there is no indication that the unstrained resistor must be any particular type of resistor. Indeed, it is well understood in the relevant art that resistors are electronic components that may change their resistance, and thereby the resulting electronic signal, such as by way of exposure to mechanical, light or thermal changes. See McGraw-Hill Dictionary of Scientific and Technical Terms, 6th ed., page 1794-95 (defines a general resistor as "a device designed to have a definite amount of resistance; used in circuits to limit current flow or to provide a voltage drop." and further states at page 2133 one type of resistor is a "thermistor" that changes its resistance in response to temperature changes, and its name is actually "derived from thermal resistor."

CTS' use of "a force derived from applied weight" is appropriate. The "unstrained resistor" is mounted on the wing section of the substrate. The applied force acts on the "step section." The "step section" concentrates the force onto the "center section" which is adapted to flex in response. The wing section is configured such that it does not flex even if the center section does. Therefore, the resistor is not subject to the concentrated force acting on the "center section" which necessarily is a derivative of the gravitational force acting on the "step section."

TK again seeks to have the Court interpret the claim language to limit its scope to the preferred embodiment. In urging that the claimed resistor must be a "strain resistor whose resistance changes based on the strain from an applied force," TK is essentially saying that the claimed "unstrained resistor" must be a mechanical resistor. As CTS points out, this interpretation would improperly read out other types of resistors, such as thermal resistors. Claim 5 does not say "strain resistor." Rather, claim 5 simply states "resistor" and includes no restriction on the type of resistor, let alone a "strain resistor" that changes resistance based on strain from an applied force, as TK suggests. There is no clear and unmistakable indication that the unstrained resistor must be a mechanical strain resistor. The unstrained resistor is simply any type of resistor that is not experiencing any strain. In addition, "out of the strain path" refers to the configuration of the wing section, not the unstrained resistor.

Moreover, claim 2 of the '361 patent expressly calls for strained as well as unstrained resistors of the strain gage to be connected so as to form a wheatstone bridge. '361 Pat., Col. 5, ll. 28-30. Thus, according to the doctrine of claim

differentiation, the scope of claim 5 cannot be limited to only resistors that respond to mechanical strain.

As such, the Court adopts CTS' proposed interpretation. The phrase . "unstrained resistor" means "a resistor mounted to the wing section but not subject to a force derived from applied weight."

V. Conclusion

For the reasons stated above, the Court adopts the interpretations of the claim terms displayed in the claim charts attached as Exhibits A and B.

SO ORDERED.

AVERN COHN
UNITED STATES DISTRICT JUDGE

Dated: SEP 14 2010
Detroit, Michigan